

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JOHN C. MORRIS and RANDALL D. HAMPSHIRE

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Appeal No. 2002-1180  
Application No. 08/924,552

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ON BRIEF

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Before KRASS, JERRY SMITH and GROSS, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1, 4-7, 10, 11 and 19-26. Claims 2 and 8 have been cancelled and the examiner has indicated, at page 4 of the answer, that claims 3, 9 and 12-18 are now considered to be directed to allowable subject matter and are no longer before us on appeal.

The invention is directed to a microactuator servo system in a disk drive. In particular, the movement of the microactuators is controlled based on the movement of one or more of a plurality of other data heads. Some claims recite that the movement of the microactuators is controlled based on relative positions of a coarse actuator and each of the plurality of microactuators. Other claims are drawn to the use of a model-based, multiple-input, multiple-output (MIMO) servo controller for providing an output signal to each of a plurality of microactuators to control the position of associated data heads by actuation of the microactuators.

Representative independent claim 19 is reproduced as follows:

19. A servo system in a disc drive having a plurality of data heads and a plurality of disc surfaces, each data head being associated with a disc surface, the servo system comprising:

a coarse actuator, coupled to the plurality of data heads to position the plurality of data heads relative to the disc surfaces;

a plurality of microactuators, one microactuator being associated with each data head; and

a model-based, multiple-input, multiple-output (MIMO) servo controller providing an output signal to each of the plurality of microactuators to control position of the associated data heads by actuation of the microactuators.

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The examiner relies on the following reference:

Kobayashi et al. (Kobayashi)      5,404,255      Apr. 4, 1995

Claims 1, 4-7, 10, 11 and 19-26 stand rejected under  
35 U.S.C. § 102(b) as anticipated by Kobayashi.

Reference is made to the brief and answer for the respective  
positions of appellants and the examiner.

#### OPINION

An anticipatory reference is one which describes all of the  
elements of the claimed invention so as to have placed a person  
of ordinary skill in the art in possession thereof. In re Spada,  
911 F.2d 205, 15 USPQ2d 1655 (Fed. Cir. 1990).

After reviewing the examiner's rejections and rationales  
therefor, we conclude that the examiner has failed to establish a  
prima facie case of anticipation.

With regard to claim 1, the examiner sets forth an analysis  
of Kobayashi, at page 2 of Paper No. 11, and cites various  
portions of the reference which are alleged to teach various  
claimed steps. However, the examiner appears to have omitted, or  
ignored, certain claim limitations. For example, it is not  
clear, from the examiner's explanation of the rejection, how the  
examiner is treating the claim limitation regarding the

**"simultaneously controlling movement...based on the embedded servo information on each corresponding surface, and based on independent movement of another of the plurality of microactuators"** (emphasis added).

The examiner identifies column 12, lines 33-34, of Kobayashi as disclosing "the capability of a simultaneously data (including servo data) transfer of the data heads from a plurality of disk surfaces for controlling the positions of the heads (plural controlling inputs and plural output to each microactuator)" (sic, answer-page 2). However, we find nothing in the examiner's reasoning, nor do we find anything at the cited portion of Kobayashi, addressing the limitation that says that the simultaneously controlling movement is "based on the embedded servo information...and based on independent movement of another plurality of microactuators."

The examiner does indicate that column 12, lines 40-44, of the reference discloses a simultaneous and independent control of each individual head movement, at least attempting to address the "independent movement" aspect of the claim. However, our review of this portion of Kobayashi indicates only that

The estimation of the control target including the characteristics of the piezoelectric element is simultaneously independently performed for each head by

using the control signal 12 and the detection position signal 11 of each head.

While Kobayashi's loop gain estimation process identifies a gain from a control signal for controlling each head to a detection position signal and stores the identified gain for correcting the control signal on the basis of the gain at a point in time when each head is located at each of a plurality of track positions, the examiner has pointed to nothing in Kobayashi that discloses or suggests the simultaneous control of each microactuator "based on the embedded servo information" and "based on independent movement of another of the plurality of microactuators." Kobayashi's movement does not appear to be based on the position of other data heads but, rather, on the stored gain at a particular position on the disk surface.

Since at least this very specific claim limitation has not been convincingly shown, by the examiner, to be disclosed by Kobayashi, we will not sustain the rejection of claims 1 and 4 under 35 U.S.C. § 102(b).

With regard to independent claim 5, this claim contains features similar, although not verbatim, to independent claim 1. That is, each of the data heads is said to be simultaneously

positioned using the embedded servo information by controlling the microactuators to move the corresponding data heads "based on relative positions of the coarse actuator and each of the plurality of microactuators."

It is unclear from the examiner's statement and rationale for the rejection of claim 5, at page 2 of Paper No. 11, what the examiner relies on in Kobayashi for moving the data heads "based on relative positions of the coarse actuator and each of the plurality of microactuators." The examiner elucidates, at pages 4-5 of the answer, by citing column 8, line 51-column 9, line 27, column 11, lines 15-61 and column 12, lines 24-44, of Kobayashi for the claimed positioning based on the relative position of the course and fine actuators. We have reviewed these cited portions of the reference but fail to find the claimed features.

The examiner also contends that appellants' arguments are not commensurate in scope with the claim language. While appellants may present certain arguments regarding limitations not in the claim, their argument regarding positioning of data heads based on relative positions of the coarse actuator and each of the plurality of microactuators is clearly based on limitations appearing in the claim and these limitations have not

been adequately addressed by the examiner.

The examiner says that the claim is broad, requiring only a showing of positioning of the heads with regard to the relative position of Kobayashi's coarse (VCM) actuator and the position of the microactuators (fine) on associated disk surfaces. The examiner may have a point as to the relative breadth of the claim. However, the examiner has not convinced us that Kobayashi discloses movement of corresponding data heads based on relative positions of Kobayashi's voice coil motor and each of the plurality of microactuators.

Accordingly, we will not sustain the rejection of claims 5-7, 10 and 11 under 35 U.S.C. § 102(b).

With regard to the broader independent claim 19, appellants argue that, even assuming, arguendo, that Kobayashi discloses "model-based" servo controllers, Kobayashi does not teach or suggest the claimed "multiple-input, multiple-output (MIMO) servo controller."

The examiner's position is that Kobayashi does, indeed, disclose such a MIMO because Kobayashi described a coarse actuator 5 and microactuators 28 as being attached together (column 12, lines 26-32) and the microactuators move independently (column 12, lines 24-44), "which is in accordance

with the definition of MIMO controller on pages 16-17 and page 14, lines 1-10 of the specification. Therefore, the controller of Kobayashi...is a MIMO controller" (Paper No. 11-page 4).

The examiner's explanation, at page 5 of the answer, differs slightly, with the examiner now contending that Kobayashi discloses the claimed MIMO because it discloses one controller (column 13, lines 11-13) that simultaneously reads the embedded servo signals (column 5, lines 25-29) by a plurality of heads (multiple-inputs - see col. 12, lines 33-34); "and; simultaneously and independently controlling of each of the plurality of heads (multiple-outputs - see col. 12, lines 34-44)" (answer-page 5).

While independent claim 19 does appear to be rather broad, we agree with appellants that Kobayashi does not disclose the claimed MIMO. While Figure 8 of Kobayashi appears to disclose the control of multiple microactuators, as appellants state, at page 15 of the brief, "this is not accomplished with a multiple-input, multiple-output controller." Rather, Kobayashi uses a plurality of single-input, single-output (SISO) controllers, with each controller controlling one data head. The examiner has not convincingly pointed to anything in Kobayashi which provides an



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output signal to each of the plurality of microactuators to control position of the associated data heads by actuation of the microactuators.

While column 13, lines 11-12, mentions "one control means" used in Kobayashi, it is not clear whether this single control means is a MIMO, with multiple-inputs and multiple-outputs, as claimed. Since we cannot speculate as to the disclosure of a reference when reaching an anticipation conclusion, we will not sustain the rejection of claims 19-26 under 35 U.S.C. § 102(b).

The examiner's decision rejecting claims 1, 4-7, 10, 11 and 19-26 under 35 U.S.C. § 102(b) is reversed.

REVERSED

ERROL A. KRASS	)	
Administrative Patent Judge	)	
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	)	
	)	
JERRY SMITH	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
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	)	
ANITA PELLMAN GROSS	)	
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